REMARKS/ARGUMENTS

Reconsideration of the application is requested.

Claims 1 and 3-9 remain in the application. Claim 1 has been amended.

In the second paragraph on page 2 of the above-mentioned Office action, claims 1, 4, and 8-9 have been rejected as being unpatentable over Shimizu et al. (US Pat. No. 5,998,925) in view of Hide et al. (US Pat. No. 5,966,393) under 35 U.S.C. § 103(a).

In the penultimate paragraph on page 3 of the above-mentioned Office action, claims 5-6 have been rejected as being unpatentable over Shimizu et al. and Hide et al. and further in view of Kitagawa et al. (US Pat. No. 5,198,690) under 35 U.S.C. § 103(a).

In the first paragraph on page 5 of the above-mentioned Office action, claim 3 has been rejected as being unpatentable over Shimizu et al. and Hide et al. and further in view of Henry et al. (US Pat. No. 4,570,172) under 35 U.S.C. § 103(a).

In the penultimate paragraph on page 5 of the above-mentioned Office action, claim 7 has been rejected as being unpatentable over Shimizu et al. and Hide et al. and further in view of Ishikawa et al. (US Pat. No. 5,488,233) under 35 U.S.C. § 103(a).

The rejections have been noted and claim 1 has been amended in an effort to even more clearly define the invention of the instant application. Support for the changes is found on page 10, lines 7-9 of the specification.

Before discussing the prior art in detail, it is believed that a brief review of the invention as claimed, would be helpful.

Claim 1 calls for, inter alia:

> said first semiconductor layer absorbing part of the visible light of the first color and said first semiconductor layer re-emitting visible light of a second color having a second wavelength by a radiant transition involving said allowed energy levels within said first band gap, the second color being different from the first color, and the second wavelength being longer than the first wavelength.

Fig. 2 of Shimizu et al. shows a white light emitting diode, which has a LED semiconductor chip 202 embedded in a coating 201. The coating 201 contains fluorescent material, which converts the light emitted from the semiconductor chip partly into light of other color so that altogether the color

perception is white. The fluorescent material is preferably YAG:Ce($Y_3Al_5O_{12}$:Ce) and related compounds. These fluorescent materials are based on a host crystal, for example YAG, which is doped with a lone rare earth element, for example Ce. Normally these fluorescent materials are applied in the form of powder which is distributed in a suitable matrix.

The fluorescent materials, for example YAG:Ce, are electrical insulators and not semiconductors. In any case these fluorescent materials do not have an electrical band structure in the sense of a semiconductor and thus cannot be compared with a semiconductor with regard to their electron configuration. The Examiner has also admitted that Shimizu et al. do not disclose a semiconductor layer for radiation conversion.

Hide et al. teach the use of photoluminescent polymers for radiation conversion so that the use of a semiconductor as a radiation converter is not obtainable from Hide et al. Hide et al. only briefly mention in the background portion of the disclosure the deposition of ZnS and ZnCdS layers (namely semiconductor layers) on a LED, which is based on a Group III-nitride semiconductor material, for the production of white light. However, this kind of arrangement is considered by Hide et al. as disadvantageous so that there is no reason for

a person skilled in the art to combine Shimizu et al. and Hide et al.

Even if a person skilled in the art would combine those two documents, he or she would use a semiconductor layer, for example ZnS or ZnCdS, on the LED-chip instead of the fluorescent material layer from Shimizu et al. This combination, however, does not lead to the subject matter of claim 1 of the instant application. There is no hint in the prior art toward the forming of the re-emission layer with a semiconductor, which has a band gap and states of allowed energy levels within the band gap, wherein the allowed energy levels are involved in the production of the re-emitted radiation.

The materials mentioned in Hide et al. produce, as is generally known, radiation through the recombination of charge carriers between the conduction band and the valence band. The conduction band and the valence band are, as is also well-known, separated by the band gap so that only states outside the band gap, not the allowed energy levels within the band gap, are involved by recombination of charge carriers from the conduction band and the valence band.

Ishikawa et al. describe semiconductor compounds on the basis of ZnSe/ZnCdSe and thus are related to the compounds mentioned in Hide et al. There is also no hint in Ishikawa et al. toward the energy levels within the band gap. Especially, the figures of Ishikawa et al., which describe the band course of semiconductor elements on the basis of the corresponding compounds, only show the band edges without showing that allowed energy states within the band gap are involved in the radiation production. Also Fig. 14, which shows the band gap and the lattice spacing of ZnS, ZnSe, CdS, and CdSe, does not contain any information about a radiation production involving allowed energy levels within the band gap.

It is accordingly believed to be clear that none of the references, whether taken alone or in any combination, either show or suggest the features of claim 1. Claim 1 is, therefore, believed to be patentable over the art and since all of the dependent claims are ultimately dependent on claim 1, they are believed to be patentable as well.

In view of the foregoing, reconsideration and allowance of claims 1 and 3-9 are solicited.

In the event the Examiner should still find any of the claims to be unpatentable, counsel would appreciate a telephone call so that, if possible, patentable language can be worked out.

If an extension of time for this paper is required, petition for extension is herewith made. Please charge any fees which might be due with respect to 37 CFR Sections 1.16 and 1.17 to the Deposit Account of Lerner and Greenberg, P.A., No. 12-1099.

Respectfully submitted,

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May 25, 2004

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